USTELECOM
THE BROADBAND ASSOCIATION

August 29, 2013

Ex Parte

Ms. Marlene Dortch
Secretary
Federal Communications Commission
445 12th Street, S.W.
Washington, D.C. 20554

Re: Connect America Fund, WC Docket No. 10-90; High-Cost Universal Service Support, WC Docket No. 05-337

Dear Ms. Dortch:

Please file the attached paper entitled Connect America Fund Phase II: A Proposal for A State-And-County-Based Approach To Reverse Auctions For CAF Phase II Support in this docket.

If you have any questions, please do not hesitate to contact the undersigned

Sincerely,

Jonathan Banks
Senior Vice President
Law & Policy

cc: Amy Bender
Craig Bomberger
Carol Mattey
Steven Rosenberg
Martha Stancill
Erik Salovaara
Margaret Wiener

CONNECT AMERICA FUND PHASE II: A PROPOSAL FOR A STATE-AND-COUNTY-BASED APPROACH TO REVERSE AUCTIONS FOR CAF PHASE II SUPPORT

Submitted by USTelecom

August 29, 2013

INTRODUCTION AND SUMMARY

In November 2011, the Federal Communications Commission announced plans to create a new Connect America Fund—the "CAF"—and refocus federal universal service high-cost support from conventional telephony to broadband in areas where high costs and low population densities would otherwise make it unprofitable to provide broadband. Under the forthcoming second phase of this program ("CAF II"), incumbent local exchange carriers ("ILECs") subject to price cap regulation—whose service territories cover the vast majority of unserved U.S. households—can choose to provide broadband to FCC-designated areas throughout a given state in exchange for five years of support. If an ILEC accepts that commitment, the FCC's forward-looking cost model will allocate to that ILEC, for every supported location within its service territory within a given state, "the difference between the model-determined cost in that census block, provided that the cost is below the highest-cost threshold, and the cost benchmark used to identify high-cost areas."[1] If, however, an ILEC declines that state-level commitment, the FCC will design and conduct "reverse auctions" to elicit commitments from various providers to supply broadband to individual census blocks within the relevant state.[2] This paper examines various options for conducting such reverse auctions.

Unlike participants in conventional auctions, who acquire something by bidding the highest price for it, bidders in a reverse (or "procurement") auction compete to *provide* a service

---

1 *Connect America Fund*, Report and Order and Further Notice of Proposed Rulemaking, 26 FCC Rcd 17663, ¶ 171 (2011) ("*USF/ICC Order*") *pets. for review pending sub nom. In re: FCC 11-161*, No. 11-9900 (10th Cir. filed Dec. 8, 2011).

2 The Commission has tentatively concluded that consumers will be best served if ILECs may participate in these auctions after declining the state-level service commitment. *Id.* ¶ 1201. That is plainly the right call: an ILEC may determine that model-defined funding is insufficient to support an ILEC's provision of broadband throughout its statewide service territory, but the ILEC will still often be the most efficient provider (and thus the lowest bidder) for many discrete geographic areas within that territory.

by offering to charge the *lowest* price to the auctioneer. Very roughly speaking, the auctioneer—in this case, the FCC—defines the minimum criteria that each bid must satisfy and then selects the qualified bidder that names the lowest price. In the CAF II context, however, this basic concept is complicated by the Commission's need to reconcile two competing objectives: (1) supporting affordable broadband for as many consumers as possible (2) while staying within fixed budgetary constraints.

For example, because it needs to work within a defined budget, the FCC obviously cannot provide funding for every eligible geographic area at whatever amount is specified by the lowest bidder in that area. A dearth of bidders for some areas, combined with the potential for strategic behavior, could lead to "low bids" far above the forward-looking costs of service in those areas, and the total bill for this program would quickly exceed the $1.8 billion budget the Commission has assigned to it. The Commission will thus likely need to set an overall cap on funding for some geographic region and use an optimization algorithm to decide (roughly speaking) which combination of bids within that region would produce the greatest number of locations served within the budget established for that region.

The first question is how broadly to define that region for these purposes. As discussed below, it would be best not to set a funding budget and run an optimization algorithm either at a nationwide level (*i.e.*, in disregard of state boundaries) or at an extremely granular level (*e.g.*, for individual census blocks or tracts). Instead, the optimal approach likely falls between those two extremes and should be defined by state boundaries. In particular, the Commission should assign to each state a CAF II budget that will remain fixed at the model-generated level whether

particular price-cap ILECs within that state opt into or out of the state-level commitment.[3] And it should apply an optimization algorithm that will allocate that aggregate amount to particular bidders and locations within the state.

A second set of issues concerns how bids within each state should be structured. The Commission must address a number of variables in this context, including (1) the geographic areas for which providers may bid within a state and (2) the coverage requirements to which bidders will be subject within each area that they win. It would likely be unrealistic to expect bidders to compete for the right to provide supported service to *every* eligible census block in covered territories in the state because, by hypothesis, even the ILEC has opted out of that commitment. Theoretically, every bidder could bid instead to serve individual census blocks at block-specific prices, and the optimization algorithm could pick the best combination of winning bids. That approach, however, would be unworkable as a practical matter as there are millions of census blocks in the United States and it would create potentially severe exposure problems if bidders are prohibited from making package bids across adjacent census blocks, particularly if bidders are also required to serve all locations within the areas they win. At the same time, it would be computationally very complex (though not impossible) to structure and resolve an auction in which bidders may define their own, partially overlapping package bids for whatever territories they wish to serve.

This paper proposes a different solution that would avoid the complexities of package bidding while nonetheless reducing the exposure problem and accommodating provider-by-provider differences in network coverage and business plans. Under our proposal, bidders

[3] As will be discussed in more detail below, a limited modification to this state level budgeting rule is proposed to protect consumers in the smallest areas served by price cap carriers. *See* pages 11-12, *infra.*

generally would place bids for all eligible census blocks within specific counties, which are aggregations of census tracts (which in turn are aggregations of census blocks).[4] To limit algorithmic complexity, package bidding would be disallowed. Yet the choice of counties (rather than smaller areas) as the default geographic bidding units would make package bidding much less necessary. In particular, counties are large enough to enable a winning county-wide bidder to realize many of the scale economies that bidders could otherwise capture only through package bidding if census tracts were the geographic bidding unit. Significantly, however, bidders would not be required to serve all eligible locations within the eligible census blocks in the counties that they win; any such requirement would chill many bidders from participating in the first place, lest they incur disproportionately costly obligations to serve locations wholly outside their existing network footprints.

Each bidder would specify the support amount it requires for each county, along with the number of eligible locations it commits to serve within the county. A statewide algorithm would then select the combination of county-specific bids that will produce the largest number of new served locations within the state's budget. To avoid awarding duplicative support to multiple providers for the same locations, at most one bid would be awarded per county,[5] and after the auction, there would be only one, non-Mobility Fund federal high-cost eligible telecommunications carrier (ETC) in the price cap carrier's service territory within that county.[6]

---

[4] As discussed in more detail below, a limited exception would allow auction participants in certain counties *either* to bid for the entire county, *or* to limit their bids to a Commission-defined portion of that county. *See* pages 20-21, *infra.* This exception is necessary to ensure that support is distributed efficiently and to prevent large portions of certain counties from going unserved.

[5] Where the exception would allow bids on smaller areas within a county, at most one bid would be awarded in each such area.

[6] There would be no non-Mobility Fund, federal high-cost ETCs in price cap carrier-served areas of counties where there are no bidders or where no bidder is selected.

This approach will simultaneously maximize bidding competition within a state, reduce the exposure problem for bidders, and do so without creating the computational challenges of user-defined package bidding.

DISCUSSION

I. THE COMMISSION SHOULD HOLD EACH STATE'S CAF II BUDGET CONSTANT WHETHER PARTICULAR ILECS WITHIN THAT STATE OPT INTO OR OUT OF THE STATE-LEVEL COMMITMENT

This paper addresses two related but quite distinct contexts in which the Commission will need to define geographic areas for purposes of structuring CAF II reverse auctions. First, it will need to define the geographic areas *that are subject to individual budgets;* we advocate the use of states for that purpose, not including state-level commitments of less than $2 million, which we recommend should be auctioned separately. Second, the Commission will need to define the geographic areas *for which auction participants may place bids;* we advocate the use of counties for that purpose.[7] This section addresses the former issue, and Section II addresses the latter.

As discussed, the Commission cannot simply award CAF II support to every "winner" of competitive bidding for particular localities because that approach would quickly break the $1.8 billion budget.[8] Instead, the Commission will need to create an optimization algorithm to choose among competing bids on the basis of which combination will generate the greatest number of additional served locations within the budget set for a defined geographic region. The threshold

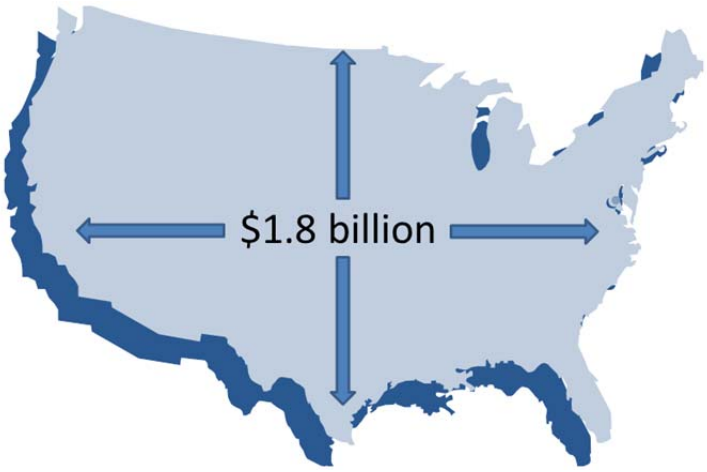
---

[7] In both cases—states and counties—the geographic area is more precisely defined as the combination of eligible census blocks identified by the Connect America Model and the challenge process that fall within the geopolitical unit.

[8] For simplicity we use the $1.8 billion overall annual figure for the CAF II program from the *USF/ICC Order*. This budget would be increased to the extent that CAF I monies are unclaimed. *Connect America* Fund, Report and Order, FCC 13-73 (released May 22, 2013) at para. 9. The funding available for the auction program would be the amount of money remaining after the elections to accept or reject state-level commitments.

methodological question is how to define the geographic regions for which budgets will be set and within which this optimization algorithm will operate.

At one extreme, the Commission could choose the continental United States as an undifferentiated geographic unit within which reverse-auction participants could place bids for eligible census blocks, and it could award support irrespective of state boundaries:



Under this approach, some states with many eligible high-cost census blocks would receive no funding at all if the optimization algorithm determined that the greatest number of locations nationwide could be served by pooling all the money in other states—potentially, just a small handful of other states. Although this state-oblivious nationwide approach would resemble the bidding regime that FCC staff adopted in connection with Mobility Fund Phase I, the contexts are quite different. The Commission adopted its Mobility Fund Phase I approach "based largely on considerations of speed and simplicity of implementation" in order to "distribut[e] this one-time support" quickly to a fraction of the areas that were eligible for such support.[9] It acknowledged that the limited coverage goals of Mobility Fund Phase I diverge widely from

[9] *Mobility Fund Phase I Auction Scheduled for September 27, 2012, Notice and Filing Requirements and Other Procedures for Auction 901*, Public Notice, 27 FCC Rcd 4725, ¶¶ 131, 135-36 (WTB & WCB 2012).

those of the Commission's longer-term universal service initiatives such as CAF II, with its much more comprehensive funding goals. *See USF-ICC Order* ¶¶ 322-23.

It would in fact be problematic to ignore state boundaries for purposes of allocating CAF II funding. Whereas states do not regulate wireless services, *see* 47 U.S.C. § 332(c), each state has played some part in regulating universal wireline service within its borders, and the FCC has thus long designed federal support mechanisms with state boundaries in mind. For example, even if a given ILEC's service footprint extends across multiple states, high-cost funding (for the ILEC or any other carrier) has traditionally been allocated on a state-by-state basis and directed to ILEC service areas that necessarily end at state boundaries. Similarly, in defining the right of first refusal for CAF II purposes, the FCC has once more relied on state boundaries, imposing on each ILEC a state-level (not region-wide) commitment to serve all eligible locations within its service footprint in a given state. Preserving each state's model-generated share of the $1.8 billion CAF II budget would likely help ensure a smooth transition from today's universal service regime to tomorrow's. In addition, it will be more feasible to design an optimization algorithm to choose auction winners on a statewide basis than a nationwide basis, given the much smaller number of bid permutations the algorithm will need to address.

On the other extreme, the Commission could set a reserve price for each eligible census block and never allow the funding for a census block to exceed its assigned budget. But that approach would also be problematic because, among other limitations, the Commission could not feasibly obtain the detailed cost information needed to set an accurate reserve price for each of the potentially millions of eligible census blocks in the United States.

True, the Commission's cost model will produce forward-looking cost estimates for individual census blocks and will use the sum of many such estimates to calculate the support

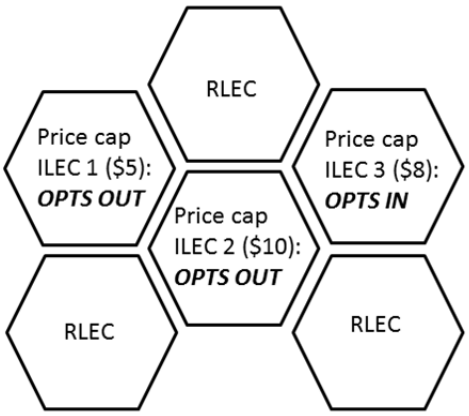
each ILEC will receive if it opts into the state-level commitment. Simply as a statistical matter, however, the sum of these many estimates is likely to be far more accurate than any given model-produced estimate for a single census block. At the census-block level, the model will inevitably yield cost estimates that may be too high for some census blocks and too low for others.[10] Because those inaccuracies are unavoidable, the Commission should set a budget not for each census block, but for a larger area over which census-block-specific cost estimates can be aggregated and their individual inaccuracies canceled out—but, again, not so large as to disrespect state boundaries in the support-allocation process.

There are two major possibilities. First, the Commission could follow through on its tentative finding in 2008 "that the wireline incumbent LEC's [state-specific] *study area* is the appropriate geographic area on which to base reverse auctions."[11] Under this approach, model-generated support amounts would be aggregated for all census blocks across an opting-out ILEC's service region within a particular state, and those amounts would set the overall budget for bidding within that area. Consider the following scenario, in which two of the three price cap ILECs in a given state opt out of their state-level commitments, and their respective service areas become subject to competitive bidding (and assuming that the modification for particularly small areas discussed below does not apply):

---

[10] Of course, where cost estimates are too *high*, the auction itself will correct the error, because competition among bidders will drive the support amounts down below those estimates to economically efficient levels. But where cost estimates for particular census blocks are too *low*, competitive bidding obviously cannot cure the problem. If those erroneously low cost estimates were used to set erroneously low reserve prices to govern bidding for those areas *in isolation*, those areas would attract no bidders because no one would be willing to serve them for the reserve price.

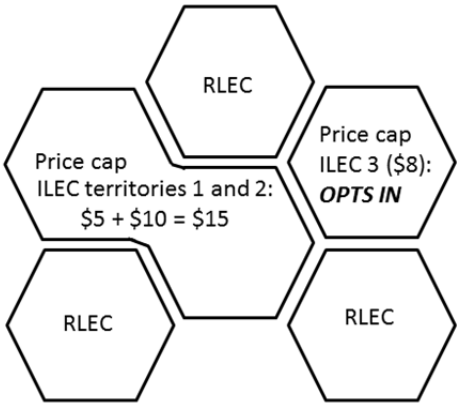
[11] *High-Cost Universal Service Support Federal-State Joint Board on Universal Service*, Notice of Proposed Rulemaking, 23 FCC Rcd 1495, 1504 ¶ 21 (2008).



State X: Two ILECs opt out, and the budgets for their respective territories are disaggregated and auctioned off separately.

The total budget available to auction winners in price cap ILEC 1's territory would be $5 million and the total budget available to auction winners in price cap ILEC 2's territory would be $10 million. And to pick auction winners, the Commission would design an optimization algorithm for each individual ILEC territory that would identify, for each such territory, the maximum number of locations that could be served within that territory's own specific budget.

Alternatively, the Commission could set a genuinely *statewide* budget that *pools* the support amounts that would have been directed to all opting-out ILECs in the state:



"Pooling": When two ILECs within the same state opt out, the support amounts for their respective territories are pooled for auction purposes, and bidders may disregard the service-area boundaries between those ILECs.

Under this approach, the only budget that would matter would be the overall budget for all opting-out ILECs within the state. The optimization algorithm would thus perform one set of calculations to determine which allocation would produce the greatest number of additional locations within the state, irrespective of price-cap ILEC boundaries.

This second option is preferable to the first because it is more likely to encourage greater auction competition. In particular, the more that bidding is restricted to any given ILEC's territory, the greater that ILEC's advantage, given existing facilities that ILECs typically already have deployed within their defined service territories. A pooled, statewide approach will blunt that ILEC advantage and increase competition for CAF II funding.

Geographic areas with state-level commitments of less than $2 million should be auctioned separately, in the event another price cap carrier with a state-level commitment in that state declines the right of first refusal. For example, a state might have three price cap carriers with Carrier One eligible for $20 million in CAF II support, Carrier Two eligible for $10 million in CAF II support, and Carrier Three eligible for $500,000 in CAF II support. In the event the smaller carrier and one or more of the larger carriers decline to exercise the right of first refusal, we recommend that the FCC exclude the area served by Carrier Three from the general state auction and subject that area to a separate reverse auction. As we explain below, this would ensure that some level of support remain for the areas served by the smaller carriers.

These smaller areas often are former rural study areas that, due to potentially higher average costs to serve, could very well not be awarded any funding through the auction process as the bidders are more apt to pursue and receive funding in the larger price cap carriers' service territories using lower average bids. This would be a temporary exemption, which the FCC would eliminate after the initial five-year CAF II commitment. Adoption of this exception would ensure that funding continues to be available to these areas either through continuation of frozen support or through a reverse auction that keeps the CAF II funding in the exemption areas. It would only be applicable where a small price cap company refuses CAF II funding and

another, larger price cap company in the same state also refuses funding. Otherwise this exception would never be triggered.

Based on a recent FCC Illustrative CAM funding scenario which had been run to estimate CAF Phase II funding by state by carrier,[12] it is estimated that excluding individual state CAF II state-level commitment offerings of less than $2 million, would impact a maximum of 22 instances of state-level commitments for a total combined funding of about $24 million. Given the small magnitude of even the maximum impact of this exception, it is in the public interest to provide an additional level of protection to these areas.

II. THE COMMISSION SHOULD STRUCTURE BIDDING ON A COUNTY-BY-COUNTY BASIS.

So far, we have considered only how to define the regions to which budgets will be assigned. Defining such regions does not itself resolve how the actual bidding should be conducted: for example, what the minimum geographic bidding units should be, whether package bidding should be permitted, and so forth. And solving *that* problem is complicated for at least two reasons: combinations of adjacent geographic areas will present strong economies of scale and each bidder will be interested in serving a *different* combination of geographic areas, such that different bidder-defined package bids would likely present many partial geographic overlaps. These challenges might well become insurmountable if providers were required to serve all eligible locations within the geographic areas that they "win."

We thus propose a bidding regime that avoids such a requirement. Under our proposal, each bidder would decide what number of eligible locations it will commit to serve within a given county and what support level it will require to meet that commitment. On the basis of

[12] See FCC CAM Scenario 3_3_3

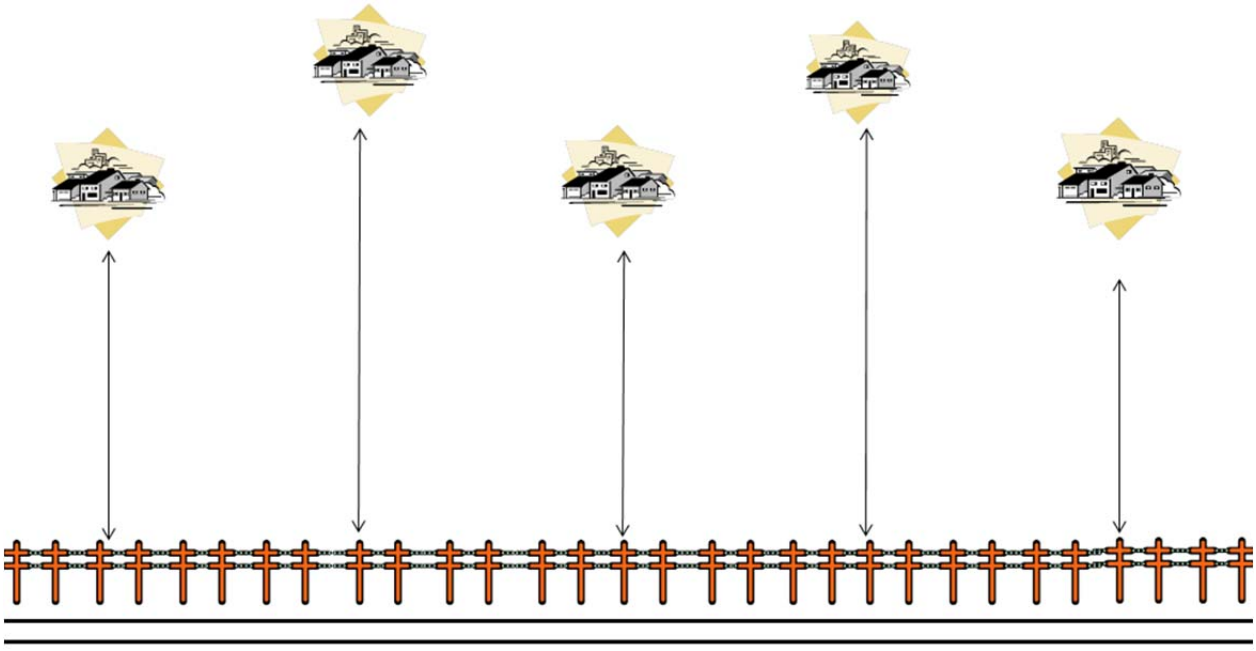
those two variables, a state-wide optimization algorithm would select the bids (generally one per county) that, in the aggregate, would produce the greatest number of additional served locations within the state at the budget allocated to that state. Before we describe that proposal in greater detail, however, we first address two alternatives that may have some appeal but would ultimately be suboptimal: (1) individualized (non-package) bidding for individual census blocks or census tracts, and (2) package bidding with bidder-defined geographic packages of census blocks or census tracts. We will assume for purposes of discussing those alternatives that bidders would be required to serve all eligible locations in the census blocks or tracts that they win.

Individualized (non-package) bidding. Suppose that the Commission sets the following rules for bidders in an upcoming reverse auction:

> You may place whatever bids you like on whichever census tracts you wish to serve within the state. But you may *not* make your bid for any census tract contingent on winning any other census tract; in other words, you may not make package bids. And you must commit to serve all eligible locations within each census tract that you win. After all the bids are in, we will run an optimization algorithm that selects the combination of census-tract-specific bids that will produce the greatest number of additional served locations within the state.

This approach would have the advantage of simplicity. But it would come with a critical drawback: it would do nothing to address the bid-distorting *exposure problem*—the risk that, in the absence of package bidding, a bidder will be stuck serving undesirable and inefficiently dispersed small areas within the larger region they had bid to serve. Networks are not, and will likely never be, deployed on such a disaggregated basis.

A simplified example illustrates that concern. Suppose that a 40-mile stretch of rural highway is abutted every eight miles by one of five small towns, each occupying its own census tract:



And suppose that, at a cost of $10 million, an efficient provider could deploy broadband to the entire area by building a fiber-optic cable along the highway ($5 million), which it then integrates with distribution cable reaching into the towns (at a cost of $1 million per town). Finally, suppose that, if the provider can serve all five towns (*i.e.*, all five census tracts), it can expect revenues of $5 million over the relevant time horizon ($1 million per town).

In this scenario, a rational provider could bid for a mere $5 million in CAF II subsidies to serve the entire area. But that business plan could make sense *only* if the provider can be certain that it, and not some other provider, will receive support to serve each of the five towns. If it serves only one of the five, it would still incur many of the same costs—$6 million—but could now expect retail revenues of only $1 million, and thus it would still need $5 million in CAF II support in order to break even.[13] If the Commission required separate (but concurrent) bidding

[13] Of course, even if other providers receive funding to serve the other four towns, our featured provider could still try to win some customers in those towns by incurring the incremental costs ($1 million per town) of building out its network to them. But it would be much less likely to do that if it knows that other providers are already receiving subsidies to do

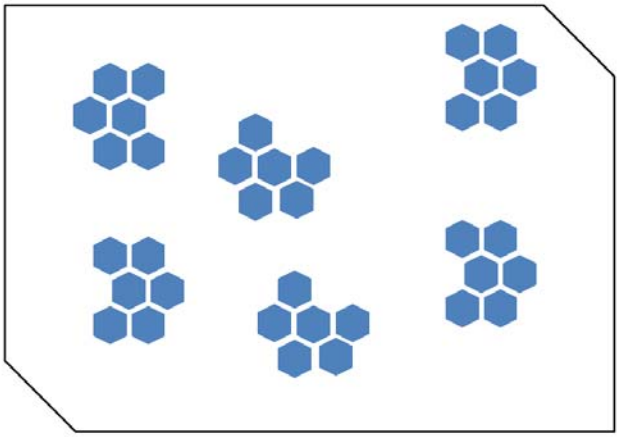
for each town/census tract, the lowest bid for any given town would therefore likely be $5 million. But if the Commission allowed each bidder to place an all-or-nothing (*i.e.*, package) bid to serve all five towns, auction participants could bid on that *five*-town package for $5 million. Thus, if the support level is held constant, all-or-nothing five-town bidding would elicit bids to serve *five times* the customer locations that would be served under concurrent town-by-town auctions. This example illustrates a central point: solving the exposure problem produces much more favorable auction outcomes for consumers.

Bidder-defined package bidding. This discussion might be read to suggest that, to address the exposure problem, the Commission should create a mechanism for package bidding, allowing bidders to make their bids for some geographic units (such as census tracts) contingent on winning other geographic units. Such an auction design is not impossible, and in other contexts may make sense. But this is a very large, as-yet untested program. And the problem is that every potential bidder has a different business plan and a different existing network and service footprint. Each provider will understandably wish to place its own unique package bid, which would predictably overlap in part with other bidders' package bids. That fact would introduce complexity into the auction process.

To see this point, suppose that Bidder X wishes to compete for CAF II support in 36 census tracts throughout a state and that those census tracts are arranged in several *non-contiguous* clusters of six *contiguous* census tracts apiece:

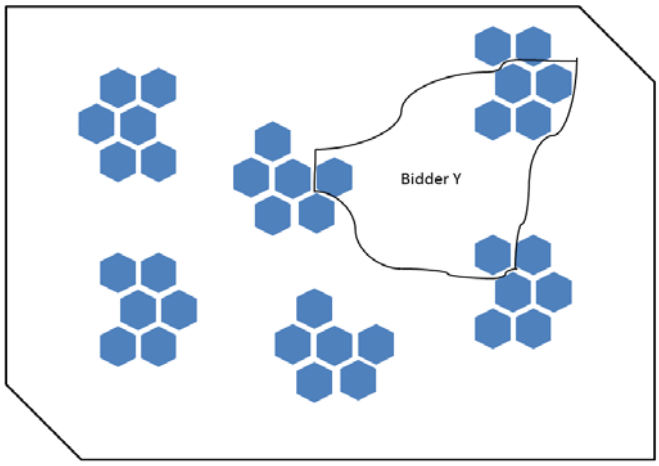
---

the same thing, because it could recover only a fraction of the anticipated revenues (probably less than $500,000 per town).



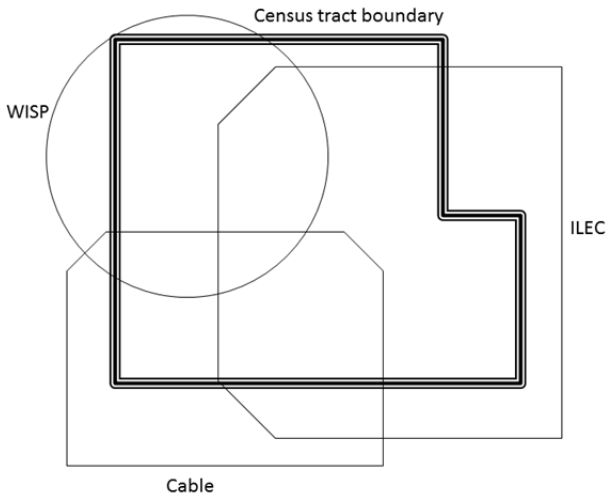
Suppose further that, to exploit scale economies, Bidder X places package bids for each cluster: that is, it makes its bids for census tracts within any given cluster contingent on winning other census tracts within the same cluster.

Now suppose that Bidder Y wishes to place a competing package bid for a different and partially overlapping combination of census tracts, based on its quite distinct business plan:



These bids are mutually exclusive: If Bidder Y wins its package bid, Bidder X must lose its package bid for each of the three partially overlapping clusters, and if Bidder X wins any of those package bids, Bidder Y must lose its package bid. Because this example is highly simplified and involves only two bidders in a state, an optimization algorithm could still be expected to crunch the numbers and select winners. As the Commission has observed, however,

the algorithmic challenges would become significantly more complex as the number of competing and partially overlapping bids increases.[14] In fact, the problem is more severe than this because (1) bidders will often refuse to bid to serve areas outside their existing network footprints (or will substantially increase their support requirements to reflect the risk of having to build out beyond those footprints), (2) no two bidders' footprints will be the same, and (3) each bidder's footprint is generally oblivious to the boundaries of census tracts (or even census blocks):



[14] *See generally* Public Notice, *Mobility Fund Phase I Auction Scheduled for September 27, 2012; Comment Sought on Competitive Bidding Procedures for Auction 901 and Certain Program Requirements*, 27 FCC Rcd 530, 539 ¶ 32 (WTB & WCB 2012) (selecting winning bidders "can be difficult . . . with large numbers of partially overlapping package bids"); *see also* Comments of AT&T, *Mobility Fund Phase I Auction Scheduled for September 27, 2012*, AU Docket No. 12-25, at 6-8 (filed Feb. 24, 2012) Pekeč & Rothkopf, *supra*, at 1489-91. The Commission has asked whether, to reduce the complexity inherent in partial geographic overlaps, it should pre-design a "hierarchy" of permissible bidding packages, each of which is precisely defined and fully nested within the next-higher permissible package in the hierarchy. *See USF-ICC Order* ¶ 1211. That approach would indeed reduce complexity by eliminating the problem of partial overlap among competing package bids. But that approach would almost certainly be infeasible to implement in this context. This is not like a spectrum auction, where the Commission is selling a new resource that all bidders might predictably be interested in obtaining for the same pre-defined geographic areas (such as EAs, MEAs, and REAs). Instead, each bidder will be looking for support to fill the interstices in its own existing networks, and each bidder's needs will be both highly individualized and difficult to shoehorn into any generally applicable geographic definition.

As noted, we have been assuming to this point that any of these auction regimes would require winning bidders to serve all eligible locations within whatever geographic areas they win. That requirement might be unattractive to potential bidders if they could not define the areas for which they are bidding as coextensive with their individual footprints. In particular, because it is more efficient in the short-term to upgrade existing network facilities than to make greenfield deployments, any obligation to serve all locations in an area could artificially suppress auction participation by radically increasing the cost to each bidder of "winning" an area if—as will often be the case—the bidder's existing footprint does not extend to all such locations. As a result, the bidder in that position is likely to either limit its auction participation or increase its bids (*i.e.*, demand greater support levels).

In sum, any bidding solution to the CAF II auction process will need to accomplish three objectives:

- it must account for the exposure problem—that is, it must reduce the bid-distorting risk that bidders will be stuck serving areas they do not wish to serve if they cannot win adjacent areas needed to achieve scale economies;
- it must allow each bidder to tailor its bid to its own existing particular network and business plans; and
- it must be as simple as possible to implement.

Those three objectives can be achieved—but only if the Commission avoids any requirement that a winning bidder serve every eligible location within the geographic areas that it wins.

A county–based bidding solution. Under our proposal, the county would be the default geographic bidding unit, with limited exceptions where necessary to protect consumers. In the nested hierarchy of geographic areas stretching from census blocks to the full United States,

counties lie exactly in the middle; they are aggregations of census tracts, which in turn are aggregations of census blocks. Just as counties never cross state lines, census tracts never cross county lines.[15] Critically, unlike census tracts, counties are generally large enough to include the geographically adjacent areas that a given provider needs to be able to serve in order to capture most scale economies. True, like census tracts, counties do encompass land areas that often extend well beyond the footprints of individual bidders' networks, and the Commission must address that concern if it wishes to elicit broad participation in these auctions. The proper solution is not to allow individual carriers to bid on highly variable, carrier-specific fragments of counties that overlap in ways that make it impossible to calculate an efficient auction outcome, but instead to free bidders from the obligation to serve all eligible locations within the counties they win, while nonetheless giving them incentives to commit to serve as many such locations as possible. The combination of these two factors—relatively large geographic bidding units (counties), and the absence of any obligation to serve all eligible locations within those areas—would substantially reduce the exposure problem *without creating any need for user-defined, overlapping package bidding and its attendant complexities*.

With these considerations in mind, we propose the following auction mechanism. For each county in which it wishes to participate, a bidder would submit a bid with two main variables: the number of eligible locations within that county that it commits to serve, and the amount of support that it requires in order to meet that commitment.[16] On the basis of those

---

[15] *See* United States Census Bureau, *Census Tracts and Block Numbering Areas* (visited May 22, 2013), http://www.census.gov/geo/www/cen_tract.html ("Census tracts do not cross county boundaries.").

[16] The bidding could be structured in any of several different ways: for example, the Commission could solicit "best offers" (one-time sealed bids) from auction participants, or it could conduct multi-round bidding in which bidders for each county can see and react to other bidders' initial bids (which could be anonymized).

variables, a statewide algorithm would determine which combination of county-specific bids will produce the greatest number of additional served locations within the state's budget.[17] To ensure that no two winning bidders would receive funding to serve the same locations, the algorithm would be programmed to select at most one winning bidder per county , with the exception discussed below for counties served by more than one price cap carrier.[18] After the auction, there would be only one, non-Mobility Fund federal high-cost ETC in the price cap carrier's service territory in that county, and price cap carrier-served counties or areas of counties that do not contain auction winners would have no CAF Phase II federal high-cost ETC. Because counties do not overlap with one another, and because bidders would be prohibited from placing package bids across counties, that algorithm would be very simple to apply—and much simpler than the algorithms that would be needed in any combinatorial bidding with bidder-defined packages.

Although this auction mechanism would be structured around county-by-county bidding, it would include a limited exception to account for counties served by multiple price cap carriers, each of which has CAF II eligible locations. In such counties, if two or more of the price cap carriers decline the state-level commitment, an auction participant would be permitted *either* to bid for the entire county, *or* to limit its bid to locations within one of those price-cap ILECs' service territories.

---

[17] As noted above, the statewide budget equates to the model-generated support that the relevant price-cap ILECs would have received had they opted into the state-level commitment.

[18] The Commission could not avoid the redundant-funding problem simply by requiring bidders to disclose the actual locations they wish to serve because, in a predictably large number of cases, there will be partial overlaps among competing bidders. Choosing among such bidders within the same county would thus raise all of the computational complexity concerns noted above in connection with bidder-defined package bidding.

This exception would not affect the basic operation of the auction process or materially increase its complexity. Unlike package bids, these partial-county bids would not be user-defined or partially overlapping, and thus they could be evaluated just like ordinary county-wide bids under the statewide algorithm.[19] A bidder would identify the number of eligible locations within the portion of the county that it commits to serve and the amount of support it needs to do so, and the algorithm would compare that bid against all other bids statewide to determine which combination of bids would produce the greatest number of additional served locations within the state budget. The difference would be that this subset of counties could have more than one winning bidder (but at most only one winner per ILEC service territory).

This would be a limited exception, available only in those counties where two or more price-cap ILECs have funded census blocks within their service territories *and* two or more of those ILECs reject the state-level service commitment. Although limited, such an exception would yield significant benefits to consumers and potential bidders. Often, an ILEC may be the lowest bidder within the part of a county that it serves and could win an entire county on that basis. But if such a carrier were to prevail in the auction in a divided county, the remainder of that county outside the carrier's service territory may go entirely unserved, even if another provider (either the other ILEC or a competitive provider) could serve many locations there with relatively little support.[20] This exception provides a path for bidding to serve these supported locations.

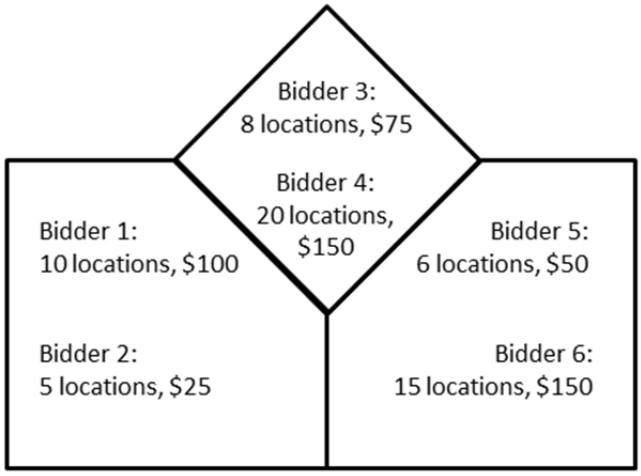
---

[19] Of course, these partial-county bids could fully overlap with a county-wide bid for the same locations, but calculating the winner in that scenario would introduce only minimal additional complexity into the statewide algorithm.

[20] Importantly, *any* bidder in such a county could elect to serve locations only within a specific price-cap ILEC's service territory. For example, a cable operator or a WISP could forgo a county-wide bid and choose to serve locations in the particular service territory where it could deploy broadband at the lowest cost.

Of course, the winning combination under this auction mechanism may well not completely exhaust the state's designated budget—*i.e.*, it may leave a "remainder." In that case, the Commission would conduct a round of supplementary bidding for otherwise unsupported census tracts within that state. Alternatively, the Commission could pool such state remainders and distribute the funding through a nationwide auction.

A simplified example illustrates how our proposed auction mechanism would work in practice. Suppose that there are three counties in a state, that there are two bidders for each county, that the bids are arranged as shown below, and that the state's overall budget is $250:



The algorithm would examine the set of all permissible combinations of bids: *i.e.*, combinations that do not exceed $250 in the aggregate and, to avoid overlap problems, do not involve choosing more than one winner from any given county (unless the limited exception applies). That set would include the following combinations:

- Bidders 1 and 4 ($250, 30 additional served locations)
- Bidders 1, 3, and 5 ($225, 24 additional served locations)
- Bidders 1 and 6 ($250, 25 additional served locations)
- Bidders 2, 3, and 6 ($250, 28 additional served locations)

- Bidders 2, 4, and 5 ($225, 31 additional served locations)

The winning combination would be the last one—consisting of Bidders 2, 4, and 5—because it would produce the greatest number of additional served locations without exceeding $250. Indeed, that combination would leave a remainder of $25, which would enable the Commission to conduct a short additional round of supplemental bidding to enable providers to serve other eligible locations within the state (or, if the Commission preferred, other eligible locations nationwide).[21]

In sum, the approach we propose here would maximize bidding competition within each state while reducing the exposure problem and avoiding the computational complexities of user-defined package bidding. It is the most feasible, pro-competitive solution to the exceedingly complex bidding challenges the Commission would otherwise confront.

[21] It might initially appear that the combination of Bidders 2, 3, and 4 should prevail on the theory that it would produce 33 additional served locations within the $250 budget. But that combination is disallowed because Bidders 3 and 4 have placed bids in the same county. That disallowance makes sense: the ostensible 33 locations may well reflect significant double-counting of locations covered by both Bidders 3 and 4. That said, both bidders could win in a county subject to the exception allowing partial-county bidding: if Bidders 3 and 4 both limited their bids to different price-cap ILEC service territories, the winning combination would be Bidders 2, 3, and 4.